SERIES 500/1000

digital tape transports

precision magnetic tape transports for field or laboratory

get accuracy and reliability in a field tape transport...with the 500/1000 series

NO ADJUSTMENTS REQUIRED for the life of the instrument: The tape path is precision aligned . . . permanently!

MINIMUM TAPE WEAR: No relative motion between the tape and any other surface but the recording head.

MINIMUM TAPE SKEW: Single capstan drive, no pinch rollers.

NO TAPE BREAKAGE: Interlocked tape handling system.

DATA RELIABILITY: Controlled tape tension gives constant tape to head pressures and eliminates tape cinch.

FAST START AND STOP TIMES: Low-inertia capstan drive system and high volume buffer storage.

INFINITE SPEED CONTROL: Velocity servo system allows manual or programmed speed changes without pulleys, belts or gears.

NO TAPE CREEP: No tape motion across the head when power is off.

ALWAYS READY: Solid-state circuitry throughout.

ECONOMICAL: Special design features keep cost of owning and operating down.

DESIGNED SPECIFICALLY FOR FIELD USE!

- Lightweight: 40 pounds
- Low power drain: Under 100 watts
- Easy to maintain: Modular construction, interchangeable servo amplifiers, no mechanical or electrical adjustments required for the life of the instrument.

MODEL 1008 IN "OPERATE" POSITION

DESCRIPTION: Series 500/1000 transports are lightweight, precision tape units designed for digitally recording data in field, laboratory, marine or airborne applications. The units are small enough to be carried easily by one man, making them particularly suited for any application requiring portability. For fixed installations, the transports fit directly into a standard 19″ rack.

Models are offered for two tape sizes, Series 500, ½-inch and Series 1000, 1-inch, using 8-inch supply reels. Transports operate from a 12 volt storage battery in field applications or from an optional power supply which consumes less than 100 watts. High bit densities to 800 bits per inch are possible with tape speeds to 120 ips.

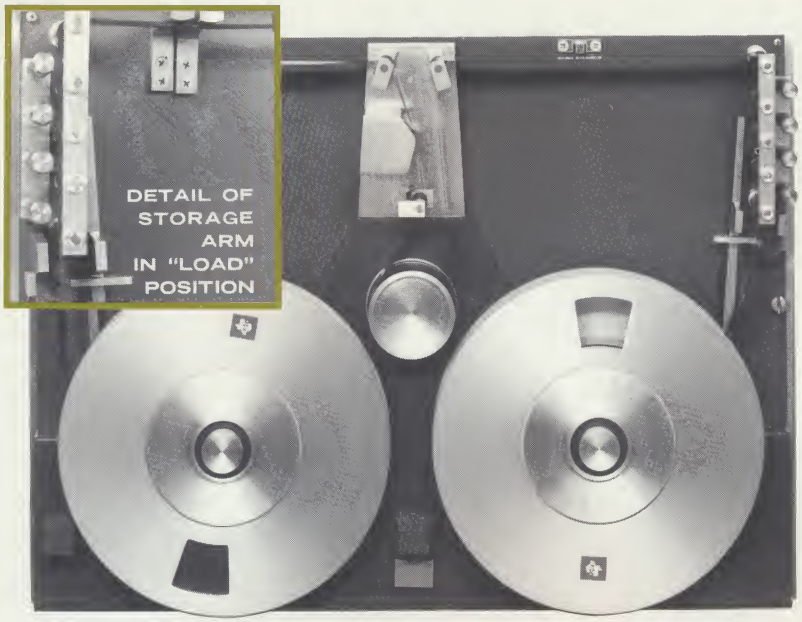
Specially designed, light, compact, permanent magnet motors are used for capstan and reel servos. An aluminum ribbed casting serves as basic structure for rigidity. The tape path is simple, consisting of supply and storage reels, mechanical storage system, head, associated guides and single capstan drive. Tape motion across the head is controlled by the capstan, which is mounted directly to the motor shaft and controlled by a precision velocity servo system.

Start-stop characteristics of the tape are precisely controlled by ramp generators with ramp time of 0.150 sec. The constant acceleration of the tape control completely eliminates transients which cause tape flap.

A mechanical tape storage system (multiple loops) buffers the relatively fast start-stop of the capstan from the high inertia reels.

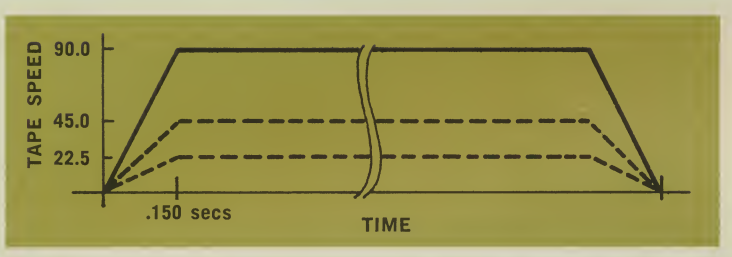
Proper tape tension is essential to good data reliability and for good reel packing; this prevents tape cinch during transit or when the reel is played back on computer transports. In Series 500/1000 transports, constant tape tension is derived by a spring lever arm system.

TI has designed the transports for precision operation throughout extremely broad environmental conditions. The single capstan drive eliminates the use of pinch rollers and their associated maintenance problems. By reducing the magnitude of forces which cause tape skew and by precision manufacturing techniques using precision modular assemblies, Series 500/1000 tape transports *do not require adjustment of any kind.*



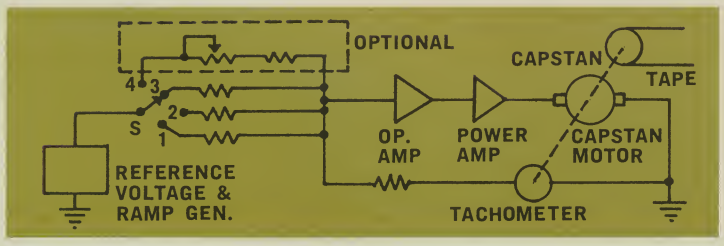
MODEL 1008 IN "LOAD" POSITION

FAST START-STOP TIMES: Series 500/1000 tape transports provide start-stop times that are an order of magnitude faster than conventional portable units. Shown in the velocity profile below, 0.150 second start and stop times provide significant savings in total power consumption.



CONTROLS: Series 500/1000 tape transports operate from a 12 volt unregulated battery and are interlocked against accidental polarity reversal. They utilize a control system designed to provide operating simplicity with fail-safe features that insure reliability and prevent tape breakage. Simultaneous selection of forward and reverse, changing of speeds while running, or any other control error can never damage tape or transport. The tape load sequence is interlocked to prevent spillage from operator error.

The TAPE UNLOAD and BRAKE RELEASE controls for changing tape reels are located on the tape transport. ON, OFF, RUN FORWARD, RUN REVERSE, TAPE SPEED SELECT must be provided remotely. TRANSPORT READY, END OF REEL and END OF TAPE indications are provided as contact closures.



for field, marine airborne and laboratory applications, here is the precision tape transport...

CAPSTAN SERVO SYSTEM: A constant tape velocity is obtained by a precision velocity servo system. Velocity of the capstan is determined by comparison of the output of a d-c tachometer attached to the capstan motor shaft, with a precision voltage reference using an operational amplifier.

Capstan speed is determined by selection of an input resistor (see diagram at lower left). In a typical application, resistors select maximum speed, ½- and ¼- maximum speed. A potentiometer can be included to provide for variable speed capability. Any fixed speed may be obtained by simply changing the input resistor.

Reference voltage is generated by a constant current source driving a precision zener diode—long term stability is better than ±1.0%. Instantaneous speed variation is typically under ±1%.

STORAGE REEL SERVO SYSTEM: The reel servo is a proportional system using output of a potentiometer attached to the storage arm to obtain position information.

specifications

	Model 508 ½-inch tape	Model 1008 1-inch tape
Tape Speed	20 to 120 ips with other ranges available	20 to 90 ips with other ranges available
Instantaneous Speed Variation	±2% from nominal	
Long-Term Speed Variation	±1% from nominal	
Rewind Speed	120 ips or same as forward	90 ips or same as forward
Interchannel Time Displacement	5 μsec at 120 ips (dynamic plus static skew)	16 μsec at 90 ips (dynamic plus static skew)
Recording Density	to 800 bpi	356 bpi
Recording Format	7 or 9 track	to 21 track
Tape	0.5 in., 1.5 mil	1-in., 1.5 mil
Tape Tension	8 oz ±5% (at head)	10.5 oz ±5% (at head)
Tape Reel Size	8-in. (1250 ft, 1.5 mil tape)	
End of Reel Sense	N.O. SPST, 0.5 amp contact is provided to indicate when supply reel has 100 ft ±20% remaining	
End of Tape Sensing	metallic leader (N.O. SPST, 0.5 amp contact rating)	
Transport Ready	SPDT relay 0.25 amp contact rating	
Start-Stop Time	0.150 sec ±10%; the velocity profile of the tape during start-stop is a ramp of 0.150 sec duration	
Start-Stop Distance	defined by relationship D = 0.075V where V = tape speed in ips	
Turn-Around Time	0.5 sec delay is required after the stop command is given before starting the transport in the opposite direction	
Operating Temperature	−10°C to +60°C (+14°F to +140°F)	
Humidity	5% to 100% (without condensation)	
Altitude	0 to 20,000 ft	
Input Power	10.5 to 16.0 v-dc, less than 100 watts at 12 v-dc	
Weight	40 lb (excluding carrying case)	
Dimensions		
Rack Mounting	19 in. x 14 in. x 8.5 in.	
Portable Carrying Case	20 in. x 16 in. x 10 in.	
Mounting	performance is completely independent of mounting orientation	
Electronics	solid state; all silicon components except for germanium motor drivers	
Remote Controls Required		
Transport Power ON	momentary N.O. SPST, 0.5 amp contact rating	
Transport Power OFF	momentary N.C. SPST, 0.5 amp contact rating	
Forward ON	± 8 to 12 volts, max source impedance of 50Ω	
OFF	less than ± 1 volt	
Reverse ON	± 8 to 12 volts, max source impedance of 50Ω	
OFF	less than ± 1 volt	
Speed Select Control	3 position, 2 pole, break before make, 10 ma contact rating	

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• REF.: Tape Transport

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132

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